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Pamphiliid Sawfly Genera *Neurotoma* and *Onycholyda* (Hymenoptera, Symphyta) of Korea

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Abstract Korean species of the pamphiliid sawfly genera *Neurotoma* and *Onycholyda* are reviewed. Five species of *Neurotoma* are six species of *Onycholyda* are recognized; *Onycholyda odaesana* n. sp. is described, *O. zinovjevi* Shinohara and *O. sertata* (Konow) are newly recorded from Korea, and the male of *N. coreana* Shinohara is described for the first time. A brief historical review, a key to the Korean pamphiliine genera, general accounts and keys to the species of the two genera are given.

Key words Hymenoptera, Pamphiliidae, *Neurotoma*, *Onycholyda*, systematics, Korea

INTRODUCTION

The Pamphiliinae are one of the two subfamilies of the web-spinning or leaf-rolling sawfly family Pamphiliidae. The subfamily consists of those pamphiliids exclusively associated with flowering plants, and East Asian representatives are classified into two tribes and three genera: the tribe Neurotomini with one genus, *Neurotoma* Konow, 1897, and the tribe Pamphiliini with two genera, *Pamphilius* Latreille, 1802, and *Onycholyda* Takeuchi, 1938. Of the three genera, *Pamphilius* is by far the largest, containing more than 90 species in the Holarctic Region. The other two genera, *Neurotoma* and *Onycholyda*, are much smaller, each with 20-30 known world species, but they are undoubtedly most diversified in East Asia.

The present paper is a review of the Korean species of the genera *Neurotoma* and *Onycholyda*, based on the examination of all the major collections of Korean sawflies known to us, probably covering almost all (if not all) the specimens of *Neurotoma* and *Onycholyda* ever collected in this country. As a result, we have recognized five species of *Neurotoma* and six species of *Onycholyda* in the Korean fauna. Of these, one species of *Onycholyda* is described as new and two species of the same genus, *O. zinovjevi* Shinohara, 1987, and *O. sertata* (Konow, 1903), are newly recorded from Korea.

The result has shown that the two genera are quite richly represented in Korea as compared with other areas. For example, five species of *Neurotoma* and three species of *Onycholyda* (two of them occur also in Korea) are known from Europe (Beneš, 1972; Zhelokhovtsev, 1988), four *Neurotoma* and ten *Onycholyda* from Japan (Shinohara, 1987a, 1993), and five *Neurotoma* and eight *Onycholyda* from North America(Beneš, 1972; Middlekauff, 1988). It should also be noted that pamphiliid sawflies of the two genera are fairly well known in the three areas cited above, and further discoveries of new or unrecorded species in Korea is much more likely than in the three areas.

Historical review: In his pioneer work on the systematics of East Asian sawflies, Takeuchi (1938) recorded *Neurotoma sibirica* Gussakovskij, 1935, and *Onycholyda viriditibialis* (Takeuchi, 1930) (under the genus *Pamphilius*) from Korea. These are the first records of the species of the two genera from this country. Kim (1963), in his extensive reivew of Korean Hymenoptera, listed *Neurotoma iridescens* (Andrē, 1882), besides the two species mentioned above. Although he gave no collection data, this is regarded as the first Korean record of *N. iridescens*. In 1970, the same author published a monographic work on the Hymenoptera of Korea, in which "*Pamphilius tenuis* Takeuchi" was newly added to the faunal list of Korea. The same species was also referred to in the "Distribution Atlas" published by the same author ten years later (Kim, 1980). However, the species identified as *P. tenuis* by Kim actually belonged to a new species later described under the name of *Onycholyda nigroclypeata* by Shinohara (1987 b). In his revision of East Asian species of *Neurotoma*, Shinohara (1980) described two new species, *N. coreana* and *N. satoi*, and newly recorded *N. atrata* Takeuchi, 1930, from Korea. Finally, Shinohara & Beneš (1988) added *Onycholyda armata* (Maa, 1949) to the list of Korean Pamphiliidae. Thus, five species of *Neurotoma* and three species of *Onycholyda* have been recorded from this country.

Abbreviations: Depositories of the specimens examined are as follows: CIS: Center for Insect Systematics, Kangwon National University, Chuncheon; EWU: Natural History Museum, Ewha Womans University, Seoul; KEI: Korean Entomological Institute, Korea University, Seoul; NSMT: National Science Museum (Nat. Hist), Tokyo; UOP: College of Agriculture, University of Osaka Prefecture, Sakai.

Names of the Provinces are abbreviated as follows: HB: Hamgyongbuk-do; HN: Hamgyongnam-do; GW: Kangwon-do; GG: Kyonggi-do; GB: Kyongsangbuk-do; GN: Kyongsangnam-do.

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SYSTEMATICS

Key to Korean genera of the Pamphiliinae.

1. Head with lateral sutures shallows, diverging anteriorly, not connected with antennal furrows, which are obsolete at least above the level of facial crests; forewing with Sc_1 absent. (Neurotomini) ..... *Neurotoma*
– Head with lateral sutures deep, not diverging anteriorly, connected with well developed antennal furrows; forewing with Sc_1 present.(Pamphiliini) 2
2. Anterior malar space with a depressed area bearing small apically recurved setae in female, and a pit bearing one (or rarely two) long seta(e) and a set of small apically recurved setae in male; tarsal claw with large acute basal lobe. ..... *Onycholyda*
– Anterior malar space with no depressed area or pit bearing recurved setae in both sexes; tarsal claw with rounded, usually inconspicuous basal lobe. ..... *Pamphilius*

Genus *Neurotoma* Konow, 1897

Neurotoma Konow, 1897, p. 18; Ross, 1937, p. 109; Middlekauff, 1958, p. 149.

Type species: *Tenthredo flaviventris* Retzius, 1783 [= *Tenthredo saltuum* Linnaeus, 1758]. Subsequent designation by Rohwer (1910).

Gongylocorsia Konow, 1897, p. 19; Ross, 1937, p. 109 [syn. of *Neurotoma*].

Type species: *Lyda mandibularis* Zaddach, 1865. Monotypic.

Neurotoma is the sole representative of the tribe Neurotomini. It is well characterized by the lateral sutures on vertex diverging in front and not continuous with antennal furrows, which are obsolete at least above the level of facial crests, the forewing with the Sc_1 atrophied, and the lancet with the lamnium enlarged. The latter two characters are considered autapomorphies of the genus (and also the tribe) supporting its monophyly. This is a small genus represented by 14 Eurasian and five North American species (Middlekauff, 1958, 1988; Shinohara, 1980, 1986 b, 1992 b, 1993). In East Asia, five species are known to occur in Korea, at least four in East Siberia, four in Japan, two in China, and one in northern Thailand.

Of the five Korean species of *Neurotoma*, three are distributed widely in northeastern Asia (one of them, *iridescens*, has a wide Palearctic distribution), and the two remaining species are endemic to Korea. It is highly possible that these two "endemic" species will eventually be found in adjacent areas of the Eurasian Continent. For more general information about the genus, see Middlekauff (1958), and for a full account of the East Asian species and a key to Palaearctic species, see Shinohara (1980).

Key to Korean species (female & male).

1. Antenna with scape and pedicel mostly black in female, at least scape black dorsally in male.·····2
 —Antenna with scape and pedicel usually entirely yellow in both sexes, at most with obscure blackish mark on upper side of scape. ·····*N. iridescens*
2. Head glabrous or nearly so; postgenal carina sharply defined.·····3
 —Head covered with long hairs; postgenal carina blunt. ·····4
3. Head entirely black, except for sometimes obscure small supraocular spot; facial and frontoclypeal crests rather weakly developed, rounded; cell C of forewing pilose.·····*N. sibirica*
 —Head richly pale-marked (Figs. 11-15); facial and frontoclypeal crests prominent, distinctly carinate; cell C of forewing glabrous. ·····*N. satoi*
4. Abdomen without distinct bluish luster. Female: Head color pattern as in Figs. 16-17; lateral pronotum entirely black. Male: Head entirely black (Fig. 18).·····*N. atrata*
 —Abdomen with distinct bluish luster dorsally. Female: Head color pattern as in Figs. 19-20; gena and lateral pronotum usually marked with yellowish white. Male: Head with large subtriangular mark on clypeus (Fig. 21) ·····*N. coreana*

1. *Neurotoma iridescens* (Andrē, 1882)

Lyda iridescens Andrē, 1882, p. 443.

Neurotoma iridescens: Konow, 1897, p. 19; Kim, 1963, p. 278 [first Korean record]; Ko, 1969, p. 304; Kim, 1970, p. 124, 716, pl. 81; Korean Soc. Plant Prot., 1972, p. 211; Shinohara, 1980, p. 95.

Distribution. Korea (GG, GW), E. Siberia, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Kurile Is. (Kunashiri Is.), N. and C. Europe.

Korean records. Previous data—GG: 1♀, "Bogwangsa, 10. V. 1980, A. Shinohara" (Shinohara, 1980). Additional material—GG: 1♀, "Anyang-sumokwon, Kim Un-suk, 1986. 6. 6" (EWU); 1♂, "Koyang-gun, Pyokche, 2 May 1971, Kim Chin-il" (KEI). GW: 1♀, Hwacheon, 27. V. 1988, M. H. Ryu" (CIS).

Host-plant. Prunus spp., *Sorbus* spp. (Rosaceae) (Shinohara, 1980).

Remarks. Kim (1963) was the first to record this species from Korea but he gave no collection data. Shinohara's (1980) record, therefore, is the only distribution data published so far. The Korean records listed above, though quite limited, indicate that this species inhabits lowlands in Korea.

2. *Neurotoma sibirica* Gussakovsky, 1935

Neurotoma sibirica Gussakovsky, 1935, p. 162, 372; Takeuchi, 1938, p. 217 [first Korean record]; Kim, 1963, p. 278; Kim, 1970, p. 125, 716; Shinohara, 1980, p. 107; Shinohara, 1992 b, p. 826.

Distribution. Korea (GW, HB), E. Siberia, Sakalin, Japan (Hokkaido), Kurile Is. (Shikotan Is.).

Korean records. Previous data—HB: 1♀, "27. Ⅶ. 1935, Mosanrei [=Musanryeong], Takeuchi" (Takeuchi, 1938). Additional material—GW: 2♀, Mirugam (Puktae-sa), 1,300m, Mt. Odae-san, 9-10. Ⅵ. 1987, A. Shinohara (NSMT); 4♀, same data except for 19. V. 1989 (NSMT, CIS); 1♀, same data except for 23. V. 1989 (NSMT); 1♀, same data except for 30. V. 1991 (NSMT); 1♀, Sangwon-sa, Mt. Odae-san, 31. V. 1991, A. Shinohara (NSMT).

Host-plant. Sorbaria sorbifolia L. var. *stellipila* Maxim. (Rosaceae) (Shinohara, 1980).

Remarks. This species has been collected on mountains in Korea. The host-plant record is available only from Japan, but Shinohara observed some pamphiliine larvae most probably referred to *N. sibirica* gregariously feeding on *Sorbaria sorbifolia* var. *stellipila* near Osaek-yaksu (about 400m alt.), Mt. Sorak-san, Kangwon-do, in early June, 1987.

3. *Neurotoma satoi* Shinohara, 1980 (Figs. 11-15)

Neurotoma satoi Shinohara, 1980, p. 103.

Distribution. Korea (GG).

Korean records. Previous data (type series only)—GG: 7♀, 2♂, Suwon, 25. Ⅳ-13. V., 1924-1934, K. Sato. No additional material.

Host-plant. Quercus acutissima Carruth. (Fagaceae) (Shinohara, 1980).

Remarks. This peculiar species is known only from the type locality, Suwon, Kyonggi-do.

4. *Neurotoma atrata* Takeuchi, 1930 (Figs. 16-18)

Neurotoma atrata Takeuchi, 1930, p. 8; Shinohara, 1980, p. 91 [first Korean record]; Shinohara, 1992 b, p. 826.

Distribution. Korea (GG), Russia (Primorskij Kraj), Japan (Honshu).

Korean records. Previous data—GG: 4♀, Suwon, 5-15. V. 1931, K. Sato (one reared specimen labeled "V. 1932") (Shinohara, 1980). No additional material.

Host-plant. Quercus acutissima Carruth. (Fagaceae) (Shinohara, 1980).

Remarks. As suggested by Shinohara (1980, 1993), *N. atrata* and four other species, i. e., *N. mandibularis* (Zaddach) from Europe, *N. sinica* Shinohara from eastern China, *N. harai* Shinohara from Japan, and *N. coreana* from Korea, form a species-group, which we call the *mandibularis* group. The component species of this group are possibly all associated with *Quercus*, although the host-plants of *N. sinica* and *N. coreana* are still unknown.

5. *Neurotoma coreana* Shinohara, 1980 (Figs. 1-2, 19-24)

Neurotoma coreana Shinohara, 1980, p. 94.

Male (hitherto undescribed). Length about 9.5mm. Head black, with large subtriangular pale yellow mark on clypeus. Mandible yellow, with base black, subapical part blackish and apex rufous. Antennal scape and pedicel black in dorsal (outer) half and pale yellow in ventral (inner) half; flagel-

lum dark brown, with dorsal (outer) surface blackish. Thorax entirely black. Wings hyaline, very faintly blackish; veins blackish brown; stigma blackish brown, with small pale area near its base. Legs: coxae entirely black; trochanters black, each with anterior surface and apical margin pale yellow (more broadly so in fore leg); fore and mid femora black with apices and anterior (ventral) surfaces pale yellow; hind femur black with anterior surface pale yellow; fore and mid tibiae and tarsi dark yellow, with apex of each segment darkened; hind tibia pale yellow in basal 1/3, becoming dark brown in apical 2/3, where dorsal surface is blackish; hind tarsus dark brown to blackish. Abdomen black, with dorsal surface bearing distinct bluish luster, and 2nd to 7th sterna with posterior margin pale yellow medially.

Structure generally similar to that of female. Postocular area (upper inner orbit) with large, sharply defined, densely coriaceous area. Antennae 23-segmented, with 3rd segment 2.3 times as long as 4th; subgenital plate with posterior margin rather narrowly rounded. Genitalia as in Figs. 22-24.

Distribution. Korea (GG, GW).

Korean records. Previous data—GG: 3♀ (type series), Suwon, 3-10. V., 1924-1931, K. Sato (Shinohara, 1980). Additional material—GG: 1♀, "85. 5. 3. Chamsil, Kwon Ho-kyong" (EWU). GW: 2♀, "Kangwon N. Univ., 14. V. 1991, Soo-won Cho, N37.52' E127.45'" (CIS); 6♀, 2♂, Mt. Samak-san, 650m, nr. Chuncheon, 9. V. 1990, A. Shinohara (NSMT).

Host-plant. Unknown, but see comments below.

Remarks. This is a member of the *mandibularis* group discussed under *N. atrata*. Although the host-plants are still unknown, the specimens from Mt. Samak-san were all captured from newly growing leaves of *Quercus* trees near the top of the mountain. Probably the larvae of this species feed on *Quercus*, like those of other species of the *mandibularis* group.

The previously unknown male of this species resembles those of *N. atrata* and *N. harai* but is distinguished from these by a combination of large pale subtriangular clypeal marking, large, sharply defined, densely coriaceous patch on the postocular area, and distinctly bluish dorsum of the abdomen. The female shows some variation in the color pattern of the head. The median part of frons may have a pair of pale spots, the pale mark along inner orbit may become reduced, and the paired pale marks on clypeus may be fused in dorsomedian part of the clypeus.

Genus *Onycholyda* Takeuchi, 1938

Pamphilius (*Onycholyda*) Takeuchi, 1938, p. 218.

Type species: *Pamphilius viriditibialis* Takeuchi, 1930. Subsequent designation by Opinion 1087, Int. Comm. Zool. Nomencl. (1977).

Onycholyda: Beneš, Naito & Okutani, 1973, p. 95; Int. Comm. Zool. Nomencl., 1977, p. 40; Shinohara, 1985 a, p. 347.

Pamphilius of authors (in part).

Onycholyda is one of the two East Asian genera of the tribe Pamphiliini. It is regarded as a monophyletic group, characterized by the following unique, apparently derived features: Anterior part of malar space with small depressed area bearing a row of recurved setae in female, and with large pit containing usually a long seta and several recurved setae in male; supraocular area with narrow, dull, densely pubescent patch in male; fore tibia with paired longitudinal smooth depressed areas or grooves ventrally (less distinct in female); tarsal claw with acute basal lobe.

A total of 30 species, including a new species described in this paper, are known in the world (Shinohara, 1985 a, 1987 a, 1987 b; Shinohara, Naito & Huang, 1988, 1991). Of these, eight occur in North America, three in western Palaearctic and 20 (including a widely distributed Palaearctic species, *O. sertata* Konow) in East Asia. The East Asian species, excepting *O. viriditibialis* and *O. odaesana* (see below), can roughly be divided into three groups from the zoogeographical viewpoint: 1) Nine species known only from Japan to Sakhalin, 2) four species distributed in southeastern Siberia (Primorskij Kraj, Khabarovskij Kraj), northeastern China to Korea, and 3) five species occurring mainly in the southern part of China. *Onycholyda viriditibialis*, which occurs in Japan, Korea and Primorskij Kraj, can be placed between the categories 1) and 2). *Onycholyda odaesana* n. sp., described below, is known only from the holotype obtained in Korea and may be classified in the category 2); however, it should be noted that the species belongs to the *wongi* subgroup of the *luteicornis* group (see comments under *O. odaesana*), which shows a typical distributional pattern of the category 3), with the previously known species all confined to southern China and northern Burma.

Thus, the Korean fauna of this genus has much in common with those of southeastern Siberia and northeastern China. Besides *O. odaesana*, which is now known only from Korea, all Korean species occur also in these areas, and, with the exception of *O. viriditibialis*, all are limited in distribution to this region. For more discussion on the genus, see Beneš (1972) and Shinohara (1985 a).

Key to Korean species.

Female

1. Abdomen black, without orange area. ·····2
 —Abdomen with median segments orange. ·····4
2. Femora entirely pale yellow. ·····3
 —Fore, mid and sometimes hind femora marked with black. ·····*O. viriditibialis*
3. Head color pattern as in Fig. 25; clypeus dull, with very distinct surface microsculpture all over. ····*O. armata*
 —Head color pattern as in Fig. 26; clypeus rather smooth, with only inconspicuous surface microsculpture and sparse punctures. ·····*O. zinovjevi*
4. Left mandible bidentate(median tooth absent); meso- and metascutella mostly or entirely black; torchanters and trochantelli entirely pale yellow; wings distinctly yellowish. ·····*O. odaesana*
 —Left mandible tridentate (median tooth present); meso- and metascutella yellow; trochanters and trochantelli marked with black; wings not distinctly yellowish. ·····5
5. Clypeus usually entirely black (Fig. 29), at most with lateral parts and narrow anterior margin

brownish; antenna with flagellum blackish brown to black; gena mostly smooth, without distinct microsculpture. ····· *O. nigroclypeata*

—Clypeus mostly yellow; antenna with flagellum brown; gena with distinct surface microsculpture, particularly in ventral part. ····· *O. sertata*

Male

1. Abdomen black, without orange area. ····· 2
—Abdomen with median segments orange. ····· *O. nigroclypeata*
2. Femora entirely pale yellow. ····· 3
—Fore, mid and sometimes hind femora marked with black. ····· *O. viriditibialis*
3. Antennal scape with black spot above; postocellar crest and meso- and metascutella pale yellow. ····· *O. armata*
—*Antennal scape entirely yellow; postocellar crest and meso- and metascutella usually entirely black.*····· *O. zinovjevi*

1. *Onycholyda viriditibialis* (Takeuchi, 1930)

Pamphilius viriditibialis Takeuchi, 1930, p. 13; Kim, 1963, p. 278; Ko, 1969, p. 304; Korean Soc. Plant Prot., 1972, p. 211.

Pamphilius (*Onycholyda*) *viriditibialis*: Takeuchi, 1938, p. 228 [first Korean record]; Okutani & Fujita, 1956, p. 3; Kim, 1970, p. 126, 716 [*viriditials!*].

Onycholyda viriditibialis: Beneš, 1972, p. 387; Shinohara, 1986 a, p. 271.

Distribution. Korea (GG, HN), Russia (Primorskij Kraj), Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Korean records. Previous data—GG: 1♀, "Shoyo-zan [=Soyo-san], 16. Ⅶ. 1935, T. Shiraki" (Takeuchi, 1938). HN: 1♀, "Genzan[=Wonsan], 10. Ⅷ. 1919, E. Gallois" (Shinohara, 1986a). Additional material—GG: 1♀, "Chonmasan, 6. 9. 1962, Kim, U-in" (EWU); 1♀ "Pogwang-sa, 79. 6. 9, Kim Son-hui" (EWU).

Host-plant. Rubus crataegifolius Bunge (Rosaceae) (Okutani & Fujita, 1956).

Remarks. This species has been collected in lowlands in Korea, and, as compared with other pamphiliines, the adults occur rather late in the season. So far as is known, this is the only species of *Onycholyda* occurring in both Korea and Japan; in Japan, where it is widely distributed and rather commonly found (as a pamphiliid), the adults emerge also late, in the early to mid summer. For more information of this species, see Shinohara (1986 a).

2. *Onycholyda armata* (Maa, 1949) (Fig. 25)

Pamphilius armatus Maa, 1949, p. 37.

Onycholyda armata: Shinohara, 1985 a, p. 349; Shinohara & Beneš, 1988, p. 806 [first Korean record].

Distribution. Korea (GW, GB, HN, HB), Russia (Khabarovskij Kraj, Primoskij Kraj), N. E. China.

Korean records. Previous data (all after Shinohara & Beneš, 1988)－HB: 1♀, 2♂, "Hakugan [=Baekam], 13. Ⅵ. 1936, K. Takeuchi". HN:1♀, "Sanbo [=Sambang], 21. Ⅴ. 1935. K. Sato". GB: 1♀, Huibang-sa, 750m, Mt. Sobaek-san, 19. Ⅴ. 1987, A. Shinohara. Additional material－GW: 1♀, Mirugam (Puktae-sa), 1,300m, Mt. Odae-san, 31. Ⅴ. 1991, A. Shinohara (NSMT); 2♀, Chin-kogae, 850m, Mt. Odae-san, 1-2. Ⅵ. 1992, A. Shinohara (NSMT, CIS); 4♀, 1♂, same data except for 26. v. 1993 (NSMT).

Host-plant. Unknown.

Remarks. In Korea, this species seems to inhabit mountains. For a full description, see Shinohara & Beneš (1988).

3. *Onycholyda zinovjevi* Shinohara, 1987 (Figs. 5-8, 26-27)

Onycholyda zinovjevi Shinohara, 1987 b, p. 644.

Distribution. Korea (new record; GG, GW, GB), Russia (Primorskij Kraj).

Korean records. GG: 1♀, "Namyangchu-gun, Chokok, 1988. 5. 28, Cho Chong-hui," (EWU). GW: 3♂, Mirugam (Puktae-sa), 1,300m, Mt. Odae-san, 29-30. Ⅴ. 1992, A. Shinohara (NSMT, CIS); 1♀, same data excetp for 28. v. 1993 (NSMT). GB: 1♂, Huibang-sa, 750m, Mt. Sobaek-san, 21. Ⅴ. 1987, A. Shinohara (NSMT).

Host-plant. Unknown.

Remarks. This species was originally described from southern Primoskij Kraj, and is recorded here for the first time from Korea. Full account of the species was given by Shinohara (1987 b).

4. *Onycholyda odaesana* n. sp. (Figs. 3-4, 28)

Female (holotype). Length about 10.5mm. Head black, with clypeus (except for narrow dorsal margin) and rather narrow postocular stripe (posteriorly obsolete) yellow (Fig. 28). Mandible dark yellow, with rufous apex; labrum and palpi dark yellow. Antennal scape and pedicel black; flagellum brown, with basal part of lst segment distinctly blackish. Thorax black, with narrow posterolateral corner of pronotum, tegula, small fading spot on each lateral margin of mesoscutellum, and small fading spot at anterodorsal corner of mesepisternum pale yellow. Wings hyaline, distinctly stained with dark yellow; veins dark yellow, those in apical 1/3 of forewing and most of those in hindwing dark brown; stigma black, with basal 1/5 and apical margin dark yellow. Legs yellow, with coxae (except for yellow apices) black. Abdomen with propodeum, dorsal surface of 6th segment and 7th and more apical segments black, and 2nd to 5th segments and ventral surface of 6th segment orange, ventrally yellowish; sawsheath blackish brown.

Upper frons below ocelli rather strongly convex, shallowly notched medially; ocellar basin subtriangular in outline, represented by broad furrow around median ocellus and its posterior and lateral extensions; median fovea large, punctiform; frontoclypeal crest arising just below median fovea, distinctly raised and carinate between antennae, and low and carinate (except for anterior part) on

clypeus; each half of clypeus very slightly convex near frontoclypeal crest and shallowly concave in lateral part; facial crest strongly inflated and rounded. Head smooth, almost impunctate and glabrous, except for clypeus and gena; clypeus distinctly coriaceous (except for rather smooth broad anterior margin), with dense irregular punctures and short inconspicuous hairs all over; gena smooth, with some shallow setiferous punctures, posterior part coarsely but shallowly rugose, punctate, and pilose. Left mandible bidentate, without median tooth; right mandible tridentate, with incision between apical and median teeth much wider and deeper than incision between median and basal teeth. Both antennae 21-segmented, with 3rd segment about 2.0 times as long as 4th.

Male. Unknown.

Distribution. Korea (GW).

Holotype: ♀, "Chin-kogae, 850m, Mt. Odae-san, Kangwon-do, Korea, 1. VI. 1992, A. Shinohara." Depostied in NSMT.

Host-plant. Unknown.

Remarks. This new species belongs to a group of species characterized by the apparently specialized bidentate left mandible. The group consists of *O. wongi* (Maa, 1944) and *O. sichuanica* Shinohara, Naito et Huang, 1988, from China, *O. birmanica* Beneš, 1972 from northeastern Burma and the present new species, and is itself a part of the *luteicornis* group* defined by Shinohara (1987 b). Here we name the former species-group the *wongi* subgroup of the *luteicornis* group after *O. wongi*, the oldest described species.

The female of the new species differs from those of *O. wongi* and *O. birmanica* in much darker coloration; i. e., dorsal part of the head, gena, antennal scape and pedicel, meso- and metascutella and 6th to 9th abdominal segments are entirely or largely black. The remaining species of the *wongi* subgroup, *O. sichuanica*, is known only from the male holotype collected in Tianquan, Sichuan Province, China, and its relationship to the new species is not entirely clear. However, we tentatively treat them as separate species, in view of a considerable difference in coloration and a very large distance between the two localities.

5. *Onycholyda nigroclypeata* Shinohara, 1987 (Fig. 29)

Pamphilius tenuis: Kim, 1970, p. 126, 717, pl. 1, fig. 9; Kim, 1980, p. 3. Not Takeuchi, 1938.
Onycholyda nigroclypeata Shinohara, 1987 b, p. 649; Shinohara, 1992 a, p. 502.

Distribution. Korea (GG, GW, GB, HN), Russia (Khabarovskij Kraj, Primorskij Kraj), N. E. China.

Korean records. Previous data-HN: ♀ (holotype), "Sanbo[=Sambang], 21, V. 1935, K. Sato". GG: 1♀, "Kwangnung, 1958. 5. 18. Ahn Chong-lin" (Kim, 1970, under the name of *Pamphilius tenuis)*; 1♀ (paratype), "Ineien," Seoul, 13. V. 1925, K. Ieiri; 1♂ (paratype), same locality, 13. V.

* The male of *O. sichuanica* lacks distinct inverted bell-shaped or fan-shaped area on the clypeus, a character peculiar to the species of the *lutericornis* group, but the reduction of the anterior (ventral) part of frontoclypeal crest should indicate its close affinity with this species-group.

1924, G. Takagi; 1♀ (paratype), Kwangnung, 11, 14. V. 1980, A. & N. Shinohara. Additional material—GG: 1♀, "Kwagnung, 1964. 5. 16, Kang Yong-pum," "Hy. 2, 7-1" (KEI); 1♀, "65. 5. 22, Kwangnung, Kim Hwi" (KEI). GW: 4♀, Mirugam (Puktae-sa), 1,300m, Mt. Odae-san, 9-10. VI. 1987, A. Shinohara (NSMT, CIS); 1♀, 1♂, Chin-kogae, 850m, Mt. Odae-san, 1. VI. 1992, A. Shinohara (NSMT); 3♀, 8⚧, same data excetp for 26. V. 1993 (NSMT). GB: 1♂, Huibang-sa, 750m, Mt. Sobaek-san, 20. V. 1987, A. Shinohara (NSMT). No locality data: 1♀, "Hy. 2, 7-2" (KEI).

Host-plant. Unknown.

Remarks. This is probably the most commonly found species of *Onycholyda* in Korea. It was first recorded from this country by Kim (1970) under the name of "*Pamphilius tenuis* Takeuchi." Shinohara has recently examined Kim's material and ascertained his earlier views (Shinohara, 1985 b, 1987 b) about the identity of this species. For full account of the species, see Shinohara (1987 b).

6. *Onycholyda sertata* (Konow, 1903) (Figs. 9-10)

Pamphilius sertatus Konow, 1903, p. 37; Kangas & Syrjänen, 1962, p. 185; Xiao *et al.*, 1991, p. 32.
Pamphilius (*Anoplolyda*) *sertatus*: Klima, 1937, p. 62.
Onycholyda sertata: Beneš, 1972, p. 387.
Pamphilius (*Onycholyda*) *sertatus*: Zhelokhovtsev, 1988, p. 30.

Distribution. Korea (new record: HB), N. and W. Europe across Siberia to the Pacific coast (Zhelokhovtsev, 1988), Altai, Jilin Prov. (Xiao *et al.*, 1991).

Korean records. HB: 2♀, "27. VII. 1935, Mosanrei [Musanryong], Takeuchi" (UOP).

Host-plant. Filipendual ulmaria (Kangas & Syrjänen, 1962).

Remarks. This widely distributed Palaearctic species is newly recorded here from Korea. The two specimens examined came from mountainous regions of northeastern corner of the country.

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韓國産 *Neurotoma*屬 및 *Onycholyda*屬(벌目, 잎벌亞目, 납작잎벌科)의 分類學的 整理

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금번조사를 통해 韓國産 납작잎벌科의 *Neurotoma*屬 및 *Onycholyda*屬은 5種과 6種으로 각각 정리된다. 이중 *Onycholyda*屬의 1 新種, *O. odaesana* sp. nov.가 새로이 記載되며, *O. zinovjevi* Shinohara와 *O. sertata* (Konow)등 2種이 韓國未記錄種으로 확인되었다. 또한 *N. coreana* Shinohara의 숫컷표

본이 처음으로 기재되었으며 上記 두 屬의 간략한 硏究史를 정리함과 동시에 屬 및 種의 檢索表를 作成하였다.

검색어 : 分類, 벌目, 납작잎벌科, *Neurotoma*屬, *Onycholyda*屬, 韓國

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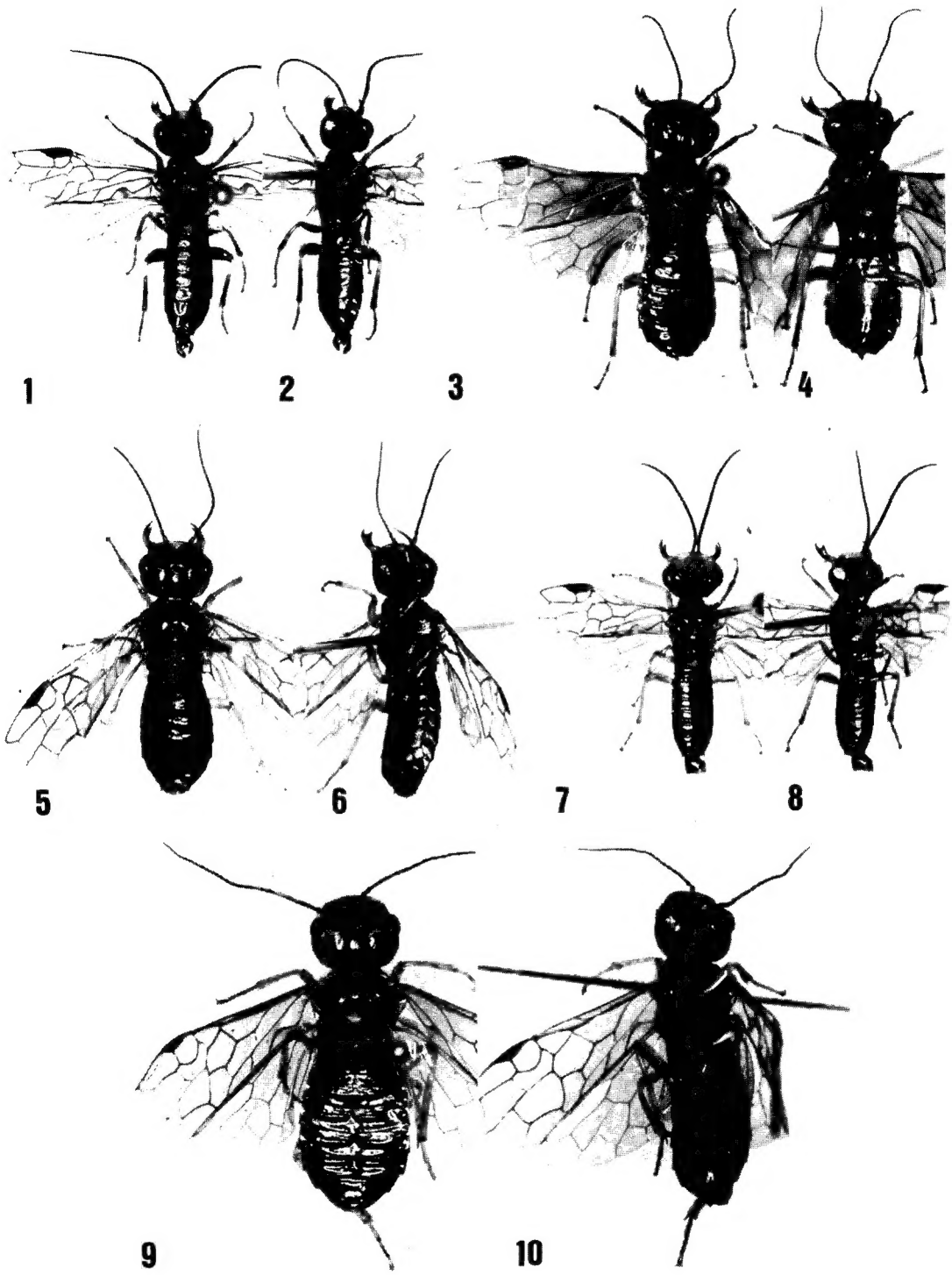
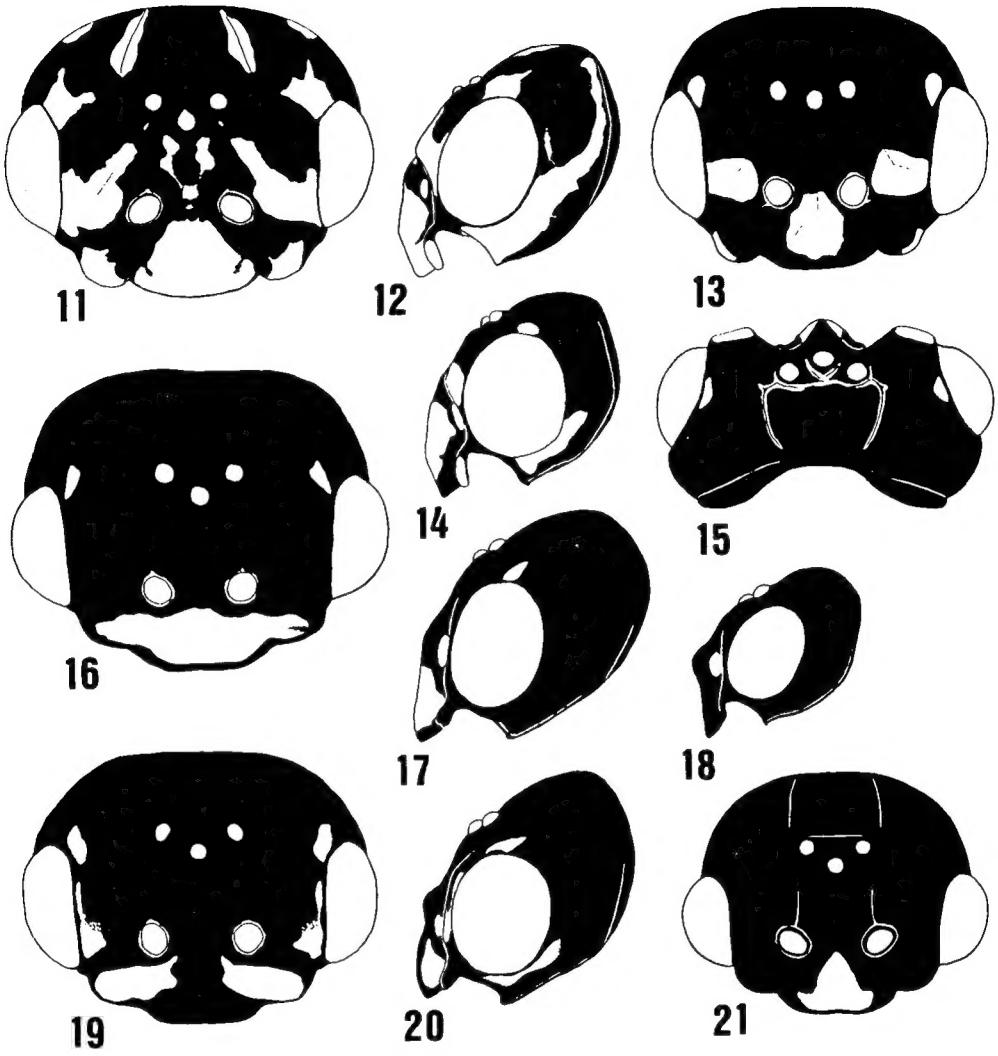
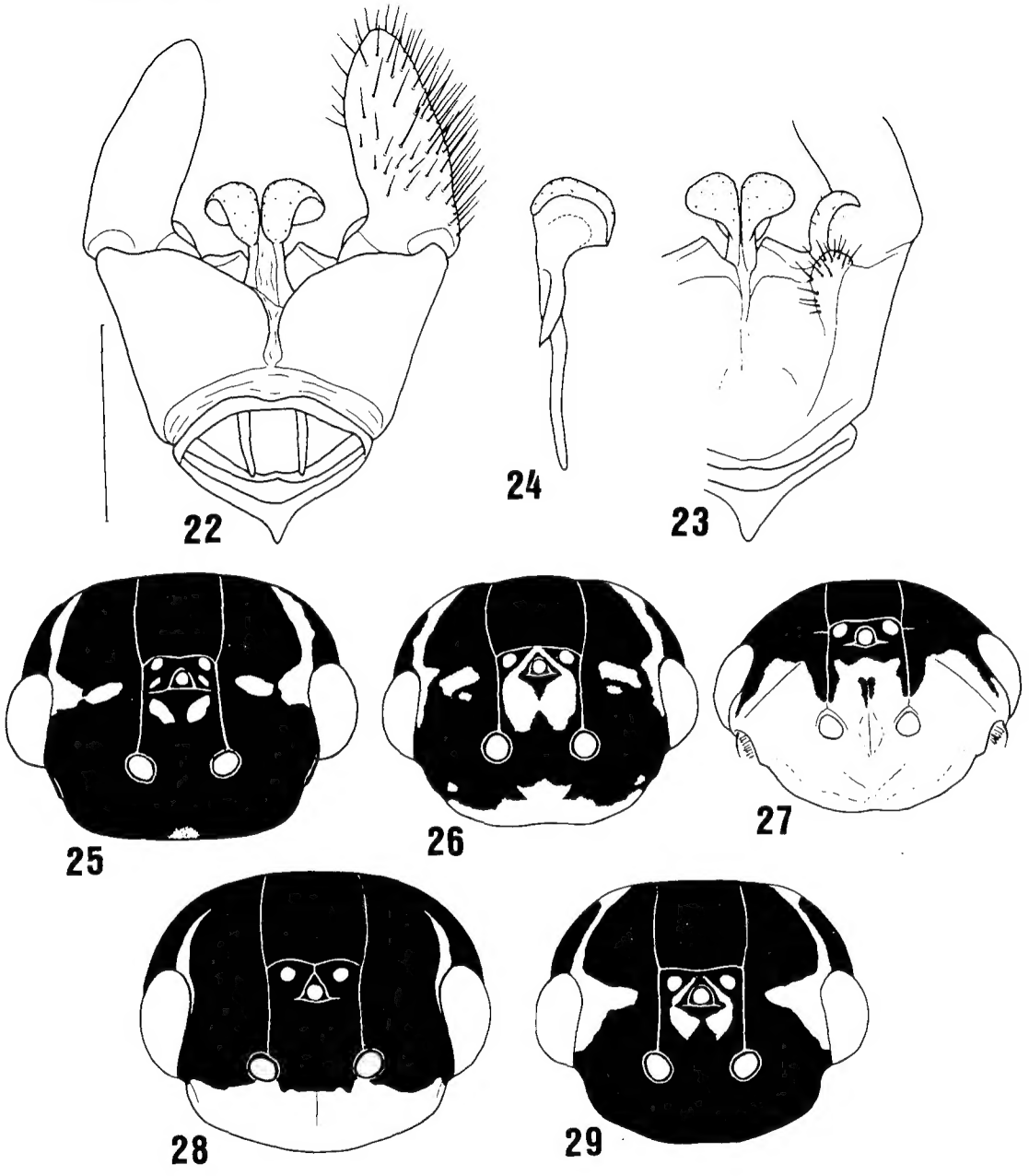


Figs. 1-10. 1-2, *Neurotoma coreana* Shinohara, ♂, Mt. Samak-san; 3-4, *Onycholyda odaesana* n. sp., ♀, holotype; 5-6, *O. zinovjevi* Shinohara, ♀, Chokok; 7-8, *ibid.*, ♂, Mt. Odae-san; 9-10, *O. sertata* (Konow), ♀, Musanryong.



Figs. 11-21. *Neurotoma* spp., heads, dorsofrontal (11, 13, 16, 19, 21), lateral (12, 14, 17-18, 20) & dorsal (15) views: 11-12, *N. satoi* Shinohara, ♀, holotype; 13-15, *ibid.*, ♂, paratopotype; 16-17, *N. atrata* Takeuchi, ♀, holotype; 18, *ibid.*, ♂, Fukui, Japan; 19-20, *N. coreana* Shinohara, ♀, holotype; 21, *ibid.*, ♂, Mt. Samak-san. (Figs. 11-20, redrawn from Shinohara, 1980.)



Figs. 22-29. *Neurotoma coreana* Shinohara, ♂, genitalia, Mt. Samak-san (22-24) and *Onycholyda* spp., heads, dorsofrontal view (25-29): 22, dorsal view; 23, ventral view; 24, penis valve, lateral view; 25, *O. armata* (Maa), ♀, Haolingtsu, N. China; 26, *O. zinovjevi* Shinohara, ♀, holotype; 27, *ibid.*, ♂, paratype from Khasan, Primorskij Kraj; 28, *O. odaesana* n. sp., ♀, holotype; 29, *O. nigroclypeata*, ♀, holotype. (Scale for Figs. 22-24: 0.5mm; Fig. 25 redrawn from Shinohara & Beneš, 1988, and Figs. 26-27 & 29 from Shinohara, 1987 b.)